

NYISO Actions During a Capacity Deficiency

Aaron Markham

DIRECTOR, GRID OPERATIONS

RRS

February 2019, Rensselaer NY



Background

- **The NYISO has multiple processes that are exercised prior to the Day Ahead Market to ensure sufficient capacity is available to meet system needs:**
 - Capacity Market
 - Outage Scheduling process to approve generator outages
- **This presentation will focus on actions to resolve a capacity deficiency after the Day Ahead Market is run.**

Actions to Respond to a Capacity Deficiency are Outlined in Section 4.4 of the Emergency Operations Manual

- **Actions are generally taken in the order listed but lead time and severity of the shortage can result in deviations.**

4.4 - Operating Reserve Deficiency

- **Shortage Operating Reserve – Day-Ahead Forecast**
 - If the Security Constrained Unit Commitment (SCUC) program indicates that NYISO will be short of Operating Reserves in the DAM, or if SCUC has already been completed and conditions then change such that the forecast indicates there will be an Operating Reserve deficiency, the NYISO will determine the action(s) listed below that are necessary.
 - In all of the following steps where additional capacity resources are being evaluated, the NYISO shall determine if each step is sufficient to eliminate the deficiency. In addition, all notifications made to TOs shall include approximate next-day starting time and duration associated with each curtailment step.

4.4 - Operating Reserve Deficiency (cont.)

- **Shortage Operating Reserve – Day-Ahead Forecast**
 1. Initiate an e-mail to all Market Participants requesting additional generation bids for the specific category required.
 2. Perform a Supplemental Resource Evaluation (SRE) Request from the Market Information System (MIS) database of unaccepted/uncommitted bids for additional Reserve for the hours specified and commit/schedule the generation.
 3. Determine the amount of energy available from external NYCA Installed Capacity (ICAP) providers that were not selected in the DAM. Count energy associated with these ICAP providers from other Balancing Authorities to NYCA and NYISO Operating Reserve. Advise the affected external Reliability Coordinator accordingly.

4.4 - Operating Reserve Deficiency (cont.)

- **Shortage Operating Reserve – Day-Ahead Forecast**
 4. Count energy associated with external energy sales by NYCA ICAP providers as NYISO Operating Reserve. Advise the affected external Reliability Coordinator accordingly.
 5. Notify NYISO Stakeholder Services of predicted day-ahead system conditions.
 6. Direct the TOs to notify the appropriate Market Participants to be prepared for the potential dispatch to Upper Operating Limit Emergency (UOLe) for the next day.

4.4 - Operating Reserve Deficiency (cont.)

- **Shortage Operating Reserve – Day-Ahead Forecast**
 7. Notify the appropriate Market Participants to prepare to make Special Case Resources (SCR) available for the next day and count expected relief.
 8. Notify the appropriate Market Participants to prepare to make the EDRP resources available for the next day and count expected relief.
 9. Initiate an Emergency Energy Alert in accordance with NERC Standard EOP 002 for the next day via the RCIS; follow NPCC notification requirement, and notify NYISO External Affairs, PSC, and the NYS Department of Environmental Conservation (DEC).

4.4 - Operating Reserve Deficiency (cont.)

■ Shortage Operating Reserve – Day-Ahead Forecast

10. Request the TOs to prepare to curtail non-essential company loads for the next day and to notify appropriate Market Participants to prepare to curtail non-essential company load for the next day.
 - A. Request the TOs to notify interruptible customers in accordance with contractual agreements to prepare to make interruptible load available for curtailment for the next day.
 - B. Request the TOs with Manual Voltage Reduction equipment to prepare to initiate procedures to reduce voltage by 5% for the next day.
 - C. Request the TOs to contact large industrial and commercial customers to request voluntary curtailment of load the next day.
 - D. Request the TOs to make general radio and TV appeals to the public to request voluntary curtailment of electric power.
11. Count Load Relief that can be implemented within 10 minutes using Quick Response Voltage Reduction as NYISO 10-minute reserve.

4.4.2 - Shortage Operating Reserve In-Day

- The NYISO will monitor the total operating capacity in day. The NYISO shall prepare the NYISO daily status report twice daily in anticipation of the morning peak and evening peak load.
- If deficiency in Operating Reserves is still forecasted, or if Real-Time Commitment (RTC) forecasts a shortage of reserve or energy for the next hour, the NYISO will take the steps not taken in the DAM that time permits to meet reserve requirements.
- Additionally, the NYISO will take any or all of the following actions as required based on the category of Operating Reverse Shortage:

4.4.2 - Shortage Operating Reserve In-Day (Cont.)

- In all of the following steps where additional capacity resources are being evaluated, the NYISO shall determine if each step is sufficient to eliminate the deficiency. In addition, all notifications made to TOs shall include approximate starting time and duration associated with each curtailment step.
 1. Initiate an e-mail to all Market Participants requesting additional generation bids for the specific category required.
 2. Perform an SRE Request from the MIS database of unaccepted/uncommitted bids for additional Reserve for the hours specified and commit/schedule the generation.

4.4.2 - Shortage Operating Reserve In-Day (Cont.)

Declare Warning State

1. Determine the amount of energy recallable from external ICAP resources that was not selected in the DAM. Count energy available from external NYCA ICAP providers from other Reliability Coordinators to NYCA as NYISO Operating Reserve. Advise the affected Reliability Coordinators accordingly.
2. Count energy associated with exports from NYCA to other Reliability Coordinators by NYISO ICAP providers as NYISO Operating Reserve. Advise the affected Reliability Coordinators accordingly.
3. Notify NYISO Special Case Resources (ICAP) that they are counted toward NYISO Operating Reserves, and may be required to be activated during a specified period of time.

4.4.2 - Shortage Operating Reserve In-Day (Cont.)

4. Notify EDRP participants that they are counted toward NYISO Operating Reserves, and may be requested to be activated during a specified period of time.
5. Notify NYISO Market Relations of predicted system conditions.
6. Notify the Market Participants to be prepared for the potential of using UOLE operation for the day and direct all Market Participants to follow basepoints.

4.4.2 - Shortage Operating Reserve In-Day (Cont.)

7. Initiate an Emergency Energy Alert in accordance with NERC Standard EOP 002 for today via the Reliability Coordinators Information System (RCIS); Notify natural gas pipelines via notification requirements, follow DOE and NPCC notification requirements, notify NYISO External Affairs, PSC, and DEC.
8. Notify Market Participants to activate Special Case Resources (ICAP) to start at XXXX hrs and end at XXXX hrs.
9. Notify Market Participants to activate EDRP to start at XXXX hrs and end at XXXX hrs.

4.4.2 - Shortage Operating Reserve In-Day (Cont.)

Declare Alert State

1. Request the TOs, via Emergency Hot Line, to curtail non-essential company loads and to notify appropriate MPs to curtail non-essential company loads.
 - A. Request the TOs, via Emergency Hot Line, to curtail interruptible customers in accordance with contractual agreements.
 - B. Request the TOs with Manual Voltage Reduction equipment, via Emergency Hot Line, to begin procedures to reduce voltage 5%.
 - C. Request the TOs, via Emergency Hot Line, to contact large industrial and commercial customers to request voluntary curtailment of load.
 - D. Request the TOs, via Emergency Hot Line, to make general radio and TV appeals to public to request voluntary curtailment of electric power.
2. Count Load Relief that can be implemented within 10 minutes using Quick Response Voltage Reduction as NYISO 10-minute reserve.

4.4.3 - Shortage Operating Reserve - Real Time

- The NYISO will monitor the total Operating Reserve using the reserve monitor programs. If an operating shortage occurs, the NYISO will count SCR and EDRP available from prior notification and take any of the following steps that have not already been taken.
- Additionally, the NYISO will take any or all of the following actions as required based on the category of reserve shortage:

Following a Contingency

Based on the New York State Reliability Council rules:

- Following a contingency, the ten minute operating reserve shall be restored within thirty minutes of the time that the contingency occurred or sooner if possible.

4.4.3 - Shortage Operating Reserve - Real Time (Cont.)

A Non-Contingency Based Shortage

Based on NPCC policy:

- Each Area shall restore its ten-minute reserve as soon as possible, and within 90 minutes if it becomes deficient and the deficiency is not a result of a contingency that is a reportable event.
- Each Area shall restore its thirty-minute reserve within four hours if it becomes deficient.

4.4.3 - Shortage Operating Reserve - Real Time (Cont.)

Declare Alert State

1. If deficient of 10-minute synchronized reserve direct all Market Participants to convert 30-minute non-synchronized reserve or 10-minute non-synchronized reserve to energy or 10-minute synchronized reserve.
2. If deficient of 10-minute reserve:
 - A. Direct all Market Participants to convert 30-minute reserve to energy or 10-minute reserve.
 - B. Count or curtail energy associated with exports from NYCA to other RCs by NYISO ICAP providers as NYISO Operating Reserve based on the RC's ability to have the transaction curtailed. Advise the affected external RC accordingly.

4.4.3 - Shortage Operating Reserve - Real Time (Cont.)

- C. Count the load reduction available from Quick Response Voltage Reduction as 10-minute reserve.
- D. Activate use of UOLe limits,
- E. Direct TOs, via Emergency Hot Line, to notify the appropriate Market Participants that the NYISO is dispatching to UOLe and that they are to follow basepoints and to make all generator capability available
- F. Purchase Emergency Energy from sources outside NYISO.

4.4.3 - Shortage Operating Reserve - Real Time (Cont.)

If deficient of 30-minute reserve:

- **Count or curtail energy associated with exports from NYCA to other Reliability Coordinators by NYISO ICAP providers as NYISO Operating Reserve based on the Reliability Coordinator's ability to have the transaction curtailed. Advise the affected external Reliability Coordinator accordingly.**
- **Count the load reduction available from Quick Response Voltage Reduction as 10-minute reserve to increase 10 minute reserve thus increasing 30 minute reserve.**

4.4.3 - Shortage Operating Reserve - Real Time (Cont.)

- Activate use of UOLe Limits
- Direct TOs, via Emergency Hot Line, to notify the appropriate Market Participants that the NYISO is dispatching to UOLe and that they are to follow basepoints and to make all generator capability available
- Purchase Emergency Energy from sources outside NYISO

4.4.3 - Shortage Operating Reserve - Real Time (Cont.)

Declare a Major Emergency

- Initiate an EEA in accordance with NERC standard EOP 002 for today via the RCIS;
- NPCC notification requirement notify NYISO External Affairs, PSC, DEC, Gas Pipelines, and the Department of Energy (DOE) with form OE 417.
 1. Notify the TOs via Emergency Hot Line and the appropriate Market Participants via the NYISO notification manager software that the NYISO has activated Special Case Resources (ICAP) if possible.
 2. Notify the TOs via Emergency Hot Line and the appropriate Market Participants via the NYISO notification manager software that the NYISO has activated EDRP.
 3. Alert other TOs, and Reliability Coordinators if applicable, that a sharing of reserves may be required.

4.4.4 - Shortage of Meeting Load / unable to Zero ACE - Real Time

Declare a Major Emergency

1. Initiate an Emergency Energy Alert in accordance with NERC Standard EOP 002 for today via the RCIS; follow NPCC notification requirement notify NYISO External Affairs, PSC, DEC, Gas Pipelines, and the Department of Energy (DOE) with form OE 417
2. Direct TOs, via Emergency Hot Line, to notify the appropriate Market Participants to go to UOLe limits, follow basepoints, and that the NYISO is in a generation alert.
3. Recall external energy sales provided by NYCA ICAP providers.
4. Notify the appropriate Market Participants to activate NYISO Special Case Resources, if possible.

4.4.4 - Shortage of Meeting Load / unable to Zero ACE - Real Time (Cont.)

5. Notify the appropriate Market Participants to activate EDRP, if possible.
6. Direct TOs, via Emergency Hot Line, to notify the appropriate Market Participants to go to UOLe limits and to continue to follow basepoints
7. Purchase Emergency Energy from sources outside NYISO.
8. Direct TOs, via Emergency Hot Line, to implement 5% Quick Response Voltage Reduction on a system wide basis.

4.4.4 - Shortage of Meeting Load / unable to Zero ACE - Real Time (Cont.)

9. Request neighboring RCs to implement Voltage Reduction to supply Emergency Energy, provided transmission permits.
10. Direct all TOs, via Hot Line, to notify appropriate Market Participants that the NYSDEC air emissions waiver is in effect, go to Max Gen even it if may result in temporary exceedance of NOx RACT air emission limits and opacity requirements.
11. Direct all TOs, via Hot Line, to shed load immediately in sufficient amounts to maintain tie loadings within limits, return the NYCA ACE to zero within 10 minutes attempting to return the system frequency to 60 hertz in accordance with NYISO criteria.